ILLUMINATED SIGN

TECHNICAL FIELD

The invention pertains to the general field of illuminated signs and more specifically to an illuminated sign that employs an electroluminescent lamp that is particularly adaptable for use with an article of clothing.

BACKGROUND ART

Illuminated signs for use on articles of clothing are worn to advertise a particular store or business, a trademark or other novelty statements. In general, the prior art has disclosed several designs for an illuminated display panel consisting of two or more stacked panels and a power source.

The panel facing the apparel is generally smooth to allow easier attachment and to prevent tearing the apparel surface. The outer panel has a plurality of bores into which is inserted and retained an equal number of light-emitting diodes (LEDs) and in some cases incandescent bulbs. The center panel normally contains the electrical wire routing and any control circuits that may be required to operate the panel. The assembled display panel is powered by a battery that may be located on the panel itself or located externally and connected to the panel by means of an electrical cable. An on-off switch is often provided to control the application of the battery power.

The LEDs or incandescent bulbs used in the prior art must, because of their mounting configuration, protrude from the surface of the display panel. This protrusion can result in a breakage of one or more of the lights if care is not taken in storing and/or using the apparel with the panel. Additionally, the displayed design provided by the LEDs is limited to a series of discontinuous points arranged to define a letter or a curve. Thus, certain complex displays that require continuous sections for ultimate aesthetics cannot be formed as can be easily accomplished with the instant invention.

A search of the prior art did not disclose any patents that read directly on the claims of the instant invention however, the following U.S. patents were considered related:

U.S. PAT. NO.	INVENTOR	ISSUED
4,709,307	Brandon	24 November 1987
4,570,206	Deutsch	11 February 1986
4,231,079	Heminover	28 October 1980
4,164,008	Miller	7 August 1979

The Brandon patent discloses an illuminated article of clothing that uses light-emitting diodes (LEDs) to achieve the ornamental lighting pattern. The LEDs are mounted on a printed wiring board that comprises one element of a five element structure that is attached to the article of clothing. A battery is provided for illuminating the LEDs as is a control circuit for controlling the energization of the LEDs. A cable, hidden within the article of clothing, us used to electrically connect the battery power to the LEDs.

The Deutsch patent discloses an article of clothing that includes a flexible panel having a plurality of holes selected to form a pattern. Through the plurality of holes project a similar plurality of electrically illuminable members such as LEDs. The LEDs are connected through a flexible cable to an electrical power source consisting of a battery and complimentary control circuits.

The Heminover patent discloses a hat assembly having a plurality of perforations located over the upper portion of the hat. Into the perforations is inserted an equal plurality of LEDs that project through the perforations for viewing. A power and control circuit is included to energize the LEDs sequentially at a rate to optically simulate motion.

The Miller patent discloses a garment having a plurality of holes into which is inserted and protrudes an equal plurality of LEDs. The LEDs are mounted on a printed circuit board that is attached at the rear of the garment. A circuit means separate from the printed circuit board is provided that controls and powers the LEDs.

DISCLOSURE OF THE INVENTION

The illuminated sign of the instant invention provides a simple method and structure for producing a luminescent display. The display is especially suitable for attachment to an article of clothing, such as a jacket or a cap but can be also attached to a stationary structure as found on an automobile, boat, motorcycle or the like.

The light for the sign is derived from an electroluminescent lamp consisting of a laminated structure of elements that is encapsulated in a protective encapsulating film. One of these elements is the light source which consists of a transparent conductive film having a phosphor coating that when energized, produces a cool light in either a white, yellow or green/blue color. Over the luminescent panel is placed an indicia stencil that has an image cut-out through which the luminescent light from the phosphor panel projects through to show the desired stencil display.

By using a stencil, any configuration of displays, ranging from letters to artistic complex cutouts, can be made and shown. Thus, the problems of trying to create continuous aesthetic displays by using dots of lights as provided by LEDs as used in the prior art is eliminated. The only limitation in using a stencil is that it be thick enough to fit into an opening in a sign protective cover that further protects the entire encapsulated luminescent lamp.

The power and control circuit for the illuminated sign consists of a small inverter that is powered by a d-c power source such as a standard 9-volt transistor battery. The inverter output which is 140 volts a-c at a frequency of 400 Hz, is applied directly, without any further signal conditioning, to the input of the electroluminescent panel. A power switch is included in the battery circuit to allow the inverter power to be easily turned ON or OFF.

In view of the above disclosure, it is the primary object of the invention to provide a sign that produces a bright and continuous luminescent image that can be easily made, controlled and attached to primarily an article of clothing.

In addition to the primary object, it is also an object of the invention to provide a sign that:

- can also be attached to a stationary structure as found on a vehicle such as an automobile, boat or motorcycle,
- has no limit to the artwork that can be cutout on the indicia stencil whose image is displayed by the light projected by the electroluminescent lamp,
- is cost-effective to manufacture and distribute,
- is not size limited, and that